CLAIMS:

22. A method of reducing fluctuations in the output power of a distributed feedback laser arrangement incorporating a waveguide structure having a distributed feedback region, a signal amplification region for amplifying an output of the distributed feedback region and a saturable absorption region, the method comprising using light from the distributed feedback region to induce a saturable absorption grating in the saturable absorption region.

23. A method as claimed in claim 22 when effected in a laser arrangement wherein the saturable absorption region is provided at one end of said signal amplification region.

24. A method as claimed in claim 22 when effected in a laser arrangement wherein said saturable absorption region forms part of said signal amplification portion.

25. A method as claimed in claim 22 when effected in a laser arrangement wherein said signal amplification region is in a feedback loop with said distributed feedback region.

26. A method as claimed in claim 25 wherein said feedback loop is formed by coupling a portion of an output of said signal amplification region to said distributed feedback region.

27. A method as claimed in claim 22 wherein said distributed feedback laser region is formed from Erbium doped fibre.

28. A method as claimed in claim 22 wherein said signal amplification region is formed from Erbium doped fibre.

29. A method as claimed in claim 22 wherein said saturable absorption region is formed from Erbium doped fibre.

30. A method as claimed in claim 25, wherein the feedback loop provides a phase-conjugated feedback signal to the output of the distributed feedback region.

31. A method as claimed in claim 25, wherein the feedback signal provides resonant pumping as well as saturates gain in the distributed-feedback region to the threshold value.

32. A method as claimed in claim 30, wherein the feedback signal provides resonant pumping as well as saturates gain in the distributed-feedback region to the threshold value.

33. A method as claimed in claim 22 when effected in a laser arrangement wherein a number of said distributed feedback regions are connected in series.

34. A method as claimed in claim 32, wherein one signal amplification region and one saturable absorption region and one feedback loop are shared between said distributed feedback regions to form the arrangement.

35. A method as claimed in claim 22 when effected in a laser arrangement wherein the distributed feedback region comprises a Bragg grating structure.

36. A method as claimed in claim 35, wherein the Bragg grating structure comprises a chirped Bragg grating.

37. A method as claimed in claim 35, wherein the Bragg grating structure comprises a sampled Bragg grating.

38. A method as claimed in claim 35, wherein the Bragg grating structure comprises a phase shifted Bragg grating.

39. A method as claimed in claim 35, wherein the grating structure comprises an apodised grating.

40. A method as claimed in claim 22, wherein the waveguide structure comprises a planer waveguide.

41. A method as claimed in claim 40, wherein the distributed feedback region is in the form of a planer waveguide.

42. A method as claimed in claims 40 or 41, wherein the signal amplifying region is in the form of a planer waveguide.

43. A method as claimed in any one of the claims 40 or 41, wherein the saturable absorption region is in the form of a planar waveguide.

44. A method as claimed in claim 42, wherein the saturable absorption region is in the form of a planar waveguide.